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Enzymatic single molecule DNA sequencing - by deposition of individual nucleic acid bases on solid substrate

Patent Assignee: RIGLER R (RIGL-I)

Inventor: RIGLER R

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Patent Family:

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SE 9500589	A	19960818	SE 95589	A	19950217	199840 B

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Patent Details:

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SE 9500589	A	11	C12Q-001/68	

Abstract (Basic): SE 9500589 A

Enzymatic single molecule DNA sequencing comprises depositing individual nucleic acid bases on a solid substrate followed by the determination of the presence and location of individual nucleic acid bases on the substrates at high and low (cryo) temperatures using laser excitation in tiny confocal volume elements with 2 dimensional scanning of the object or image.

Also claimed are:

(1) a process for deposition of the cleavage products on to the solid substrate by electric field gradients, hydrodynamic or electroosmotic flow while the solid substrate is scanned in two dimensions;

(2) a process for deposition of the cleavage products but not the enzyme onto the solid substrate by a combination of electric field gradients, electroosmotic flow and charge properties of enzyme and nucleic acid base;

(3) the generation of tiny droplets by piezoelectric constriction or bubble jets for the deposition of nucleic acid bases on solid substrates while the solid substrate or the droplet dispenser is scanned in 2 dimensions; (4) the generation of a solid substrate (chip) with a matrix of nucleic acid bases being a permanent record of the DNA sequence;

(5) the determination of the presence and location of individual nucleic acid bases on solid substrates by CW (not defined) excitation and/or pulsed excitation and time gating;

(6) the determination of the presence and location of individual nucleic acid bases on solid substrates by excitation with a combination of laser and detector arrays, and

(7) the determination of a DNA sequence by a combination of natural nucleic acid bases (cryo temperature) and analogues (high temperature) deposited on a solid substrate.

ADVANTAGE - The method allows single molecule DNA sequencing without the need for flow devices.